

FACT SHEET FOR STATE RECLAIMED WATER PERMIT ST 6206

LOTT ALLIANCE

MARTIN WAY RECLAIMED WATER PLANT

SUMMARY

This state reclaimed water permit and fact sheet covers the reclaimed water produced at the LOTT Alliance Martin Way Reclaimed Water Plant. The discharge to Budd Inlet and the use of reclaimed water produced from the LOTT Alliance Budd Inlet Wastewater Treatment Plant is covered by National Pollutant Discharge Elimination System (NPDES) Permit No. WA0037061. The reclaimed water produced at the LOTT Alliance Budd Inlet Wastewater Treatment Plant was originally covered by Reclaimed Water Permit No. ST6159. When NPDES Permit No. WA0037061 was renewed in 2005, Reclaimed Water Permit No. ST6159 was combined with the NPDES permit. Eventually this permit may be combined with the NPDES permit to give LOTT a single system-wide permit. Until then, the treatment facilities will operate under the conditions of the NPDES permit for Budd Inlet plant and this new reclaimed water permit for the Martin Way facility.

The Martin Way Reclamation plant, which started construction in 2004, will be the first LOTT Alliance satellite plant. The first satellite system, consisting of the Martin Way Reclaimed Water Plant, ponds/recharge site, and conveyance pipelines, is referred to as the Hawks Prairie Reclaimed Water Satellite. In the future, there may be additional reuse satellite plants in the LOTT Alliance system in addition to this Class A reuse satellite facility. At least initially, additional reclaimed water permits will be issued to the LOTT Alliance to cover the other planned satellite facilities. Some aspects of the permitted LOTT system, such as pretreatment, will only be covered by the NPDES permit for the Budd Inlet discharge, and referenced in the reclaimed water permits.

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INTRODUCTION

This fact sheet is a companion document to the draft State Reclaimed Water Permit No. ST 6206. The Department of Ecology (Department) is proposing to issue this permit, which will allow the beneficial use of Class A reclaimed water. This fact sheet explains the nature of the proposed reclamation and reuse treatment, distribution and use, the Department's decisions on limiting the pollutants in the reclaimed water, and the regulatory and technical bases for those decisions.

The Reclaimed Water Act, Chapter 90.46 Revised Code of Washington (RCW), authorized the development of Water Reclamation and Reuse Standards for the beneficial use of reclaimed water. These standards were completed in 1997. All reclaimed water permits issued by the Department must specify conditions demonstrating that the wastewater has been adequately and reliably treated to meet the requirements in the Water Reclamation and Reuse Standards appropriate for the use. In addition to meeting the water quality limitations, the standards require specific treatment and disinfection requirements beyond those of most conventional wastewater treatment facilities. The standards also require automated alarms, redundancy of treatment units, emergency storage, stringent operator training requirements and public notification of reclaimed water use.

Under the Reclaimed Water Act, a permit is issued to the generator of the reclaimed water who may then distribute the water subject to the permitted provisions governing the location, rate, water quality and purposes of use. RCW 90.46.040 states that a permit is required for land application of reclaimed water. The permit is issued by the Department under the authority of Chapter 90.48 RCW which requires that a permit be issued before any discharge of pollutants to waters of the state is allowed (RCW 90.48.080 and 90.48.162). RCW 90.46.030 states that the Department of Health may issue a permit for industrial and commercial uses of reclaimed water and that the permits will govern the location, rate, water quality and purposes of use. Per memorandum of agreement between the Department of Ecology and the Department of Health (DOH), DOH requirements are included in a single permit issued by the Department.

In addition to the Water Reclamation and Reuse Standards, regulations adopted by the State include procedures for issuing permits [Chapter 173-216 Washington Administrative Code (WAC)], technical criteria for discharges from municipal wastewater treatment facilities (Chapter 173-221 WAC) and water quality criteria for ground waters (Chapter 173-200 WAC). The Reclaimed Water Act, the Water Reclamation and Reuse Standards and these regulations establish the basis for effluent limitations and other requirements which are included in the permit.

This fact sheet and draft permit are available for review by interested persons as described in Appendix A--Public Involvement Information.

The fact sheet and draft permit have been reviewed by DOH and by the Permittee. Errors and omissions identified in these reviews have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. Changes to the permit will be addressed in Appendix C--Response to Comments

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<u>GENERAL INFORMATION</u>	
Applicant	LOTT Alliance 111 Market Street Northeast, Suite 250 Olympia, WA 98501
Facility Name and Address	LOTT Alliance Martin Way Reclaimed Water Plant 6121 Martin Way East Lacey, WA 98516-5547
Type of Treatment System	Membrane Bioreactor (MBR), Class A Reclaimed Water
Discharge Location	Latitude: 47° 04' 33" N Longitude: 122° 45' 54" W.
Legal Description of Use Areas	Surface Percolation at Northeast Lacey, WA – West of Hogum Bay Road and 30 th Ave NE largely described as the NW1/4 of the SE1/4 of Sec. 2, T18N, R1W, W.M., along with other use areas within the contributing jurisdictions of Lacey, Olympia, Tumwater, or Thurston County.
Contact at Facility	Name: Laurie Pierce, LOTT Facility Manager Telephone #: (360) 528-5727
Responsible Official	Name: Michael D. Strub, P.E. Title: Executive Director Address: 111 Market Street NE, Suite 250, Olympia, WA 98501 Telephone #: (360) 664-2333 – ext. 1102 FAX #: (360) 664-2336

BACKGROUND INFORMATION

DESCRIPTION OF THE COLLECTION AND TREATMENT SYSTEM

HISTORY

The LOTT Alliance's treatment facilities comprise a regional system serving portions of the cities of Lacey, Olympia, Tumwater, and Thurston County. The Budd Inlet secondary treatment facility was largely completed and on-line in August of 1982. Prior to that time a primary treatment facility served the area. The Budd Inlet facility provides advanced treatment or more specifically, nitrogen removal. Reclaimed water production was added to the Budd Inlet facility in 2004. The LOTT Alliance has now started to add satellite reuse treatment plants to the system. The Martin Way Reclaimed Water Plant is the first of the planned satellite plants. These satellite plants are part of the long term plan to reduce dependence on the discharge to Budd Inlet.

COLLECTION SYSTEM STATUS

Each jurisdiction is responsible for its respective collection system. Several major interceptors are identified as LOTT facilities and are owned and maintained by LOTT. As a part of the LOTT planning process, each jurisdiction has produced general sewer plans. At present, the jurisdictions are updating their plans.

Thurston County currently has no collection lines that discharge into the LOTT sewer system. The City of Lacey is served primarily by a conventional collection system including 15 pump stations, over 309,500 linear feet of gravity flow sewer lines serving approximately 12 square miles. Portions of the Lacey sewer system have been designated to be served by Septic Tank Effluent Pumping (STEP) systems. The City of Tumwater is served by a conventional sewer system including over 223,894 feet of gravity sewer lines serving approximately 8 square miles. It also includes 15 wastewater pumping stations. The City of Olympia is served primarily by a conventional sewer system serving approximately 18 square miles. The system consists of over 698,212 feet of sewer pipe. The system has 51 lift stations. The system is primarily a separate sewer system; however, approximately 600 acres of the downtown area is served by a combined sewer system.

Flow to the Martin Way Reclaimed Water Plant will come from the Lacey collection system and be diverted to the satellite plant from LOTT's recently remodeled Martin Way Pump Station.

TREATMENT PROCESSES

The headworks of the Hawks Prairie satellite start at the Martin Way Pump Station. At the pump station the wastewater is screened, prior to being pumped to the Martin Way plant. Up to 2 MGD is pumped to the plant. The flow is planned to be expanded to 5 MGD in the future. Treatment at the Martin Way plant starts with grit removal. The waste then goes to a return activated sludge (RAS) mixing box and into aeration basins. The design is for a mixed liquor suspended solids (MLSS) of 7,000-8,500 mg/L in the aeration basins. MLSS is pumped from the aeration basins to the membrane tanks. The design MLSS in the membrane tanks is 10,000 mg/L. RAS is returned to an anoxic channel before the RAS mixing box. Waste activated sludge (WAS) is returned to the Martin Way Pump Station and pumped to the Budd Inlet Treatment Plant for further processing.

The effluent from the membranes is pumped to the disinfection channel. Hypochlorite is used for disinfection. The reclaimed water is then pumped to use sites.

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The Water Reclamation and Reuse Standards require the generator of the reclaimed water to either have a Department delegated industrial wastewater treatment program or all industries discharging into the generator's wastewater collection system shall have current waste discharge permits issued by the Department. LOTT has a delegated pretreatment program, as required by NPDES Permit No. WA0037061.

The LOTT Budd Inlet treatment plant is a class 4 plant, so adding the reclaimed water satellite facility does not change the overall classification of the system.

DISTRIBUTION SYSTEM AND USE AREA

The reclaimed water distribution pipeline is a 14-inch pipeline that runs three miles from the reclaimed water plant to the wetland ponds and recharge basin site. The pipeline and ponds and basin site is designed to handle the ultimate flow of 5 MGD. The ponds and basins are on a 41-acre site on Hogum Bay Road. There are five constructed wetland ponds that are used for reclaimed water storage. The ponds also allow for public visibility and education in a park-like setting. The stored reclaimed water can be sent to supply uses such as irrigation and toilet flushing. Reclaimed water not drawn from the ponds for irrigation or other uses will flow to the 8 acres of groundwater recharge basins. The reclaimed water will infiltrate through the soils to the underground aquifer. Use of the eight recharge cells will be rotated so that some of the cells can be rested and rehabilitated while others are in operation.

For all the uses, appropriate flow rates, setbacks, signs, and other controls will be in place for the use of Class A reclaimed water per the *Washington State Water Reclamation and Reuse Standards* (September 1997).

RESIDUAL SOLIDS

The Martin Way pump station and the reclaimed water plant will remove solids during the treatment of the wastewater at the headworks (grit and screenings). Waste activated sludge will be conveyed to the Budd Inlet plant through the existing collection system where it will be removed at the primary and secondary clarifiers. Incidental solids (rags, scum, and other debris) removed as part of the routine maintenance of the equipment, and grit and screenings are drained and disposed of as solid waste at the local solid waste transfer station. Solids removed from the clarifiers are treated by dissolved air floatation for thickening, anaerobic digestion for stabilization, and centrifuge dewatering for final moisture reduction. Process biosolids are hauled from the Budd Inlet plant and land applied.

GROUND WATER

The ponds and basin site will infiltrate water downward through the unsaturated zone to the shallow aquifer approximately 90-feet below the surface. The water will then move laterally away from the basins. Groundwater mounding is expected to occur. The height of groundwater mounding may be of concern because of the potential impacts to the infiltration capacity of the basins and the potential problems a high water table might create in the surrounding area.

The shallow aquifer is hosted by unconsolidated sediments that underlie the basin site. The uppermost of these sediments is the Vashon recessional gravel outwash, a highly permeable, sandy gravel that is approximately 20 feet thick at the recharge basin site. Beneath this layer is the Vashon Till layer, a low permeability unit consisting of unsorted sand, gravel, and boulders in a matrix of silt and clay. Studies at the basin site have found this layer to be generally absent. The next layer down is made up of the combination of Vashon Advance Outwash and a local unit named the Martin Way Gravel. This layer has a relatively high permeability and hosts the shallow aquifer. Below this is the Kitsap Formation, a low permeability unit composed of silty sand and clay that forms the lower boundary of the shallow aquifer.

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LOTT has installed 10 monitoring wells at the basin site that can be used to test groundwater quality. At other reuse sites where the reclaimed water will be used for irrigation, the hydrogeology is similar. All irrigation will be done at agronomic rates to prevent impacts to groundwater and to nearby surface water.

PERMIT STATUS

This is a new treatment facility. Applications for a permit were submitted to the Department on September 7, 2001, and on April 30, 2002, and accepted by the Department on August 20, 2002.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

This is a new facility, so there is no previous permit. LOTT does have other discharge permits for their facilities. During the history of the present permit for the discharge to Budd Inlet, the Permittee has remained in compliance based on Discharge Monitoring Reports (DMRs) and other reports submitted to the Department and inspections conducted by the Department.

RECLAIMED WATER CHARACTERIZATION

The concentration of pollutants in the reclaimed water is expected to meet Class A standards.

SEPA COMPLIANCE

The LOTT Alliance is in compliance with State Environmental Policy Act (SEPA) in their planning. An EIS was completed and included with the *LOTT Wastewater Resource Management Plan* (November 1998). In addition, a supplemental EIS (SEIS) for the Hawks Prairie Reclaimed Water Satellite was completed in June 2001, and an addendum to that SEIS was published in January 2002.

WATER RIGHTS STATUS

The Permittee is considered the generator of the reclaimed water and RCW 90.46.120 gives the Permittee exclusive right to any water generated by the wastewater treatment facility. Use and distribution of reclaimed water is exempted from the water right permit requirements of RCW 90.03.250 and 90.44.060. The Permittee plans to maintain exclusive right to the reclaimed water that is used for groundwater recharge, with the potential to recover a like amount from the aquifer.

PROPOSED PERMIT LIMITATIONS

The Reclaimed Water Act, Chapter 90.46 RCW requires that reclaimed water be adequately and reliably treated prior to distribution and beneficial use. State regulations require that limitations set forth in a permit issued under Chapter 90.48 RCW must be either technology- or water quality-based. Municipal wastewater must also be treated using all known, available, and reasonable treatment (AKART) and not pollute the waters of the state. The minimum criteria to demonstrate compliance with these requirements are derived from the *Water Reclamation and Reuse Standards* and Chapter 173-221 WAC.

The permit also includes limitations on the quantity and quality of the reclaimed water land applied or infiltrated to recharge groundwater via surface percolation that have been determined to protect the quality of the ground water. The approved engineering report includes specific design criteria for this facility. Water quality-based limitations are based upon compliance with the Ground Water Recharge Criteria (RCW 90.46.080) which are the drinking water standards for the parameters noted and the Ground Water Quality Standards (Chapter 173-200 WAC) for other parameters that require regulation.

The more stringent of the water quality-based or technology-based limits are applied to each of the parameters of concern. Each of these types of limits is described in more detail below.

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

All reclaimed water permits must assure that the effluent has been adequately and reliably treated so that as a result of that treatment, it is suitable for a beneficial use or controlled use that would not otherwise occur and is no longer considered a wastewater [RCW 90.46.010(40)].

The authority and duties for reclaimed water use are in addition to those already provided in law with regard to sewage and wastewater collection, treatment and disposal for the protection of public health and the safety of the state's waters. All waste discharge permits issued by the Department must specify conditions requiring all known available and reasonable methods of prevention, control, and treatment of discharges to waters of the state (WAC 173-216-110). For land application, the permit requires the reclaimed water to be applied at agronomic rates.

The Water Reclamation and Reuse Standards, 1997, outline the requirements for the additional level of treatment technology as well as water quality limits necessary for public health protection during the use of reclaimed water. The standards provide four classes of reclaimed water, Classes A, B, C, and D.

This facility produces Class A reclaimed water. Class A is the highest quality of reclaimed water and therefore provides the broadest range of reuse opportunities. Conversely, Class A reclaimed water requires the most stringent treatment and water quality limitations. The technology and water quality requirements for the production of Class A reclaimed water are as follows:

"Class A Reclaimed Water" is reclaimed water that had been adequately and reliably treated and, at a minimum is, at all times, oxidized, coagulated, filtered, and disinfected.

1. Oxidized is defined as wastewater in which the organic matter has been stabilized such that the biochemical oxygen demand (BOD₅) does not exceed 30 mg/L and total suspended solids (TSS) does not exceed 30 mg/L, is nonputrescible and contains dissolved oxygen.
2. Coagulated wastewater is defined as an oxidized wastewater in which colloidal and finely divided suspended matter have been destabilized and agglomerated prior to filtration by the addition of chemicals or by an equally effective method.
3. Filtered wastewater is defined as an oxidized, coagulated wastewater which has been passed through natural undisturbed soils or filter media, such as sand or anthracite, so that the turbidity as determined by an approved laboratory method does not exceed an average operating turbidity of 2 nephelometric turbidity units (NTU), determined monthly, and does not exceed 5 NTU at any time. For membrane bioreactors, the membranes fulfill the coagulated and filtered requirement. It has been shown by studies in California that membranes can produce water that has an average turbidity of 0.2 NTU, and that does not exceed 0.5 NTU. The use of these lower limits assures there are no leaks in the membranes.
4. Adequate disinfection is defined as the median number of total coliform organisms in the wastewater after disinfection does not exceed 2.2 per 100 milliliters, as determined from the bacteriological results of the last seven days for which analyses have been completed, and the number of total coliform organisms does not exceed 23 per 100 milliliters in any sample.
5. A 0.5 mg/L chlorine residual shall be maintained in the reclaimed water during conveyance from the reclamation facility to the use areas.

GROUND WATER QUALITY-BASED EFFLUENT LIMITATIONS

RCW 90.46.080 states that reclaimed water may be beneficially used for ground water recharge via surface percolation provided that it meets the Groundwater Recharge Criteria as measured in the ground water beneath or down gradient of the recharge project site. The groundwater recharge criteria are defined in 90.46.010 as the contaminant criteria found in the drinking water quality standards adopted by the State Board of Health pursuant to Chapter 43.20 RCW and the Department of Health pursuant to Chapter 70.119A RCW. The primary drinking water standards are listed below. Drinking water is the beneficial use generally requiring the highest quality of ground water. Providing protection to the level of drinking water standards will protect a great variety of existing and future beneficial uses.

Primary Drinking Water Standards

<u>Parameter</u>	<u>Concentration</u>
Nitrate as N	10 mg/L
Nitrite as N	1 mg/L
Arsenic	10 µg/L
Cadmium	5 µg/L
Chromium	100 µg/L
Fluoride	2 mg/L
Mercury	2 µg/L
Nickel	100 µg/L
Total Trihalomethanes (TTHM)	0.10 mg/L

RCW 90.46.080 further states that if the Ground Water Recharge Criteria do not contain a standard for a constituent or a contaminant, the Department shall establish a discharge limit consistent with the goals of the Reclaimed Water Act. In order to protect existing water quality and preserve the designated beneficial uses of Washington's ground waters including the protection of human health, WAC 173-200-100 states that waste discharge permits shall be conditioned in such a manner as to authorize only activities that will not cause violations of the Ground Water Quality Standards. Additional groundwater criteria as defined in Chapter 173-200 WAC and in RCW 90.48.520 for this discharge include the following:

Additional Ground Water Quality Criteria

<u>Parameter</u>	<u>Concentration</u>
Total Dissolved Solids	500 mg/L
Chloride	250 mg/L
Sulfate	250 mg/L
Copper	1300 µg/L
Lead	15 µg/L
Manganese	50 µg/L
Silver	100 µg/L
Zinc	5000 µg/L
pH	6.5 to 8.5 standard units
Total Iron	0.3 mg/L
Toxics	No toxics in toxic amounts

COMPARISON OF RECLAIMED WATER LIMITATIONS WITH SECONDARY TREATMENT LIMITS

Comparison of Secondary Treatment Limits and Class A Limits		
<u>Parameter</u>	<u>Secondary Treatment Limits</u>	<u>Class A Limits</u>
BOD ₅	30 mg/L monthly average	20 mg/L monthly average (when nitrogen removal is required)
TSS	30 mg/L monthly average	30 mg/L monthly average
pH	6.0-9.0	6.0-9.0
Fecal Coliform Bacteria	200/100 ml monthly average, 400/100 ml weekly average	N/A
Total Coliform Bacteria	N/A	2.2/100 ml 7-day median, 23/100 ml sample maximum
Turbidity	N/A	2 NTU monthly average, 5 NTU sample maximum, for membranes 0.2 NTU monthly average, 0.5 NTU sample maximum
DO	N/A	Measurably present
Total Nitrogen	N/A	10 mg/L monthly average
Chlorine Residual	N/A	0.5 mg/L minimum daily

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are specified to verify that the treatment process is functioning correctly, that ground water criteria are not violated, and that reclaimed water limitations are being achieved

INFLUENT AND EFFLUENT MONITORING

The monitoring and testing schedule is detailed in the proposed permit under Condition R2. Specified monitoring frequencies take into account the quantity and variability of the reclaimed water, the treatment method, past compliance, significance of pollutants, and cost of monitoring.

GROUND WATER MONITORING

The monitoring of ground water at the site is required in accordance with the Ground Water Recharge Criteria and the Ground Water Quality Standards, Chapter 173-200 WAC. To assure groundwater quality is maintained, the Department requires the Permittee to monitor and evaluate the impacts on ground water

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quality. Monitoring of the ground water at the site boundaries and within the site is an integral component of such an evaluation.

Based on the Department's understanding of the site conditions, the spatial distribution of the ten monitoring wells in the groundwater monitoring network is adequate to define the effects of recharge on groundwater quality. However, there is an issue regarding the screened interval of the monitoring wells that will need to be addressed in the future as a ground water mound forms. Ideally, monitoring wells for a recharge facility should be screened over the water table so that samples can be obtained near the water table where the recharge water and aquifer mix. Sampling near the water table is preferred because groundwater chemistry can change substantially with the depth below the water table. The height of the well water level relative to the screened interval for each monitoring well is listed below in the table. The water levels for wells MW-1 through MW-5 were obtained in January 2002 and water levels for wells MW-6 through MW-10 in May and June 2005.

Height of Water Level Relative to Screened Interval			
Well ID	Elevation of Top of Screen (amsl)	Static Water Level Elevation (amsl)	Height of Water Level Relative to Top of Screen (ft)
MW-1	127	124.06	-3.2
MW-2	117	117.82	0.8
MW-3	95	115.07	20
MW-4	175	Not Available	Not Available
MW-5	138	120.31	-17.8
MW-6	131	124.5	-6.2
MW-7	115	124.75	10.3
MW-8	109	102	-7.2
MW-9	125	107.4	-18.0
MW-10	110	102.98	-6.6

amsl= above Mean Sea Level

Under existing hydraulic conditions the table shows most wells are screened near or over the water table. However, water levels in two wells, MW-3 and MW-7, are already 20 feet and 10.3 feet, respectively, above the top of the well screen. After the discharge of reclaimed water begins, the groundwater model estimates that the water table will mound beneath the percolation basins about 13 feet at 1 million gallons per day (MGD) and about 35 feet at 5 MGD. The water levels in a number of the monitoring wells will likely rise above the screened interval. When this occurs it will not be possible to obtain samples at or near the water table. Given the current well construction, the Permittee may not be getting samples in the future that represent the water quality at the point of recharge. Potential solutions to this issue will be identified and an appropriate approach will be selected as the ground water mound is developing.

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

The conditions of R3 are based on the authority to specify appropriate reporting and recordkeeping requirements to prevent and control the distribution or use of inadequately treated wastewater.

FACILITY LOADING

The design criteria for this water reclamation facility are taken from *Martin Way Reclaimed Water Satellite Facilities* plans and specifications prepared by Brown and Caldwell and are as follows:

Capacity of Reclaimed Water:	2.0 mgd
Future Capacity of Reclaimed Water:	5.0 mgd

OPERATIONS AND MAINTENANCE

The proposed permit contains Condition R.5 as authorized under RCW 90.48.110, WAC 173-220-150, Chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment.

RESIDUAL SOLIDS HANDLING

To prevent water pollution the Permittee is required in permit condition R6. to store and handle all residual solids (grit, screenings, scum, sludge, and other solid waste) in accordance with the requirements of RCW 90.48.080 and State Water Quality Standards.

The final use and disposal of sewage sludge from the treatment system is regulated by U.S. EPA under 40 Code of Federal Regulations (CFR) 503. The disposal of other solid waste is under the jurisdiction of the local health district.

PRETREATMENT

The Water Reclamation and Reuse Standards require the generator of the reclaimed water to either have a the Department delegated industrial wastewater treatment program or all industries discharging into the generator's wastewater collection system shall have current waste discharge permits issued by the Department. WAC 173-216-110 requires that the list of prohibitions in WAC 173-216-060 be included in the permit. The NPDES permit for the Budd Inlet facility covers the delegated pretreatment program.

Federal pretreatment requirements in 40 CFR 403 and Sections 307(b) and 308 of the Clean Water Act apply to this facility. Therefore, notification to the Department is required when pretreatment prohibitions are violated and when new sources of commercial or industrial wastewater discharge are added to its system.

RECLAIMED WATER USE

These permit requirements are based on the Water Reclamation and Reuse Standards authorized in Chapter 90.46 RCW. The standards contain requirements to assure that distribution and use of reclaimed water are protective of public health and the environment at all times. These include prohibitions on bypass, alarms and storage or alternative disposal of substandard water, maintenance of operational

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records, cross connection control, use area restrictions and enforceable contracts, and a local reclaimed water use ordinance.

GENERAL CONDITIONS

General Conditions are based directly on state laws and regulations and have been standardized for all municipal waste discharge to ground water permits issued by the Department.

Condition G1 requires responsible officials or their designated representatives to sign submittals to the Department. Condition G2 requires the Permittee to allow the Department to access the treatment system, production facility, and records related to the permit. Condition G3 specifies conditions for modifying, suspending or terminating the permit. Condition G4 requires the Permittee to apply to the Department prior to increasing or varying the discharge from the levels stated in the permit application. Condition G5 requires the Permittee to construct, modify, and operate the permitted facility in accordance with approved engineering documents. Condition G6 prohibits the Permittee from using the permit as a basis for violating any laws, statutes or regulations. Condition G7 requires application for permit renewal 180 days prior to the expiration of the permit. Condition G8 describes transfer of the permit and Condition G9 requires compliance for situations like power failure. Condition G10 deals with removed substances and Condition G11 deals with providing information. Conditions G12 and G13 describe other requirements and additional monitoring. Condition G14 requires the payment of permit fees. Condition G15 describes the penalties for violating permit conditions. Condition G16 deals with property rights and G17 describes the Permittee's duty to comply. Condition G18 deals with toxic pollutants. Condition G19 lists penalties for tampering, while Condition G20 deals with reporting planned changes. Condition G21 describes reporting for non-compliance. Condition G22 deals with reporting and Condition G23 describes compliance schedule reporting.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing the beneficial use of reclaimed water, including those limitations and conditions believed necessary to control toxics, and to protect human health and the beneficial uses of waters of the state of Washington. The Department proposes that the permit be issued for five years.

REFERENCES FOR TEXT AND APPENDICES

Washington State Department of Ecology, 1993. Guidelines for Preparation of Engineering Reports for Industrial Wastewater Land Application Systems, Ecology Publication # 93-36. 20 pp.

Washington State Department of Ecology and Department of Health, 1997. Water Reclamation and Reuse Standards, Ecology Publication # 97-23. 73 pp.

Washington State Department of Ecology 1998. Chapter E-1, Criteria For Sewage Works Design, Ecology Publication # 98-37. 50 pp

Washington State Department of Ecology, 1996. Implementation Guidance for the Ground Water Quality Standards, Ecology Publication # 96-02.

Washington State Department of Health, 1994. Design Criteria for Municipal Wastewater Land Treatment, 10 pp

APPENDICES

APPENDIX A--PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to issue a permit to the applicant listed on page one of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public notice of application was published on October 8, 2000, October 15, 2000, July 15, 2002, July 21, 2002, June 22, 2005, June 29, 2005, and July 25, 2005, in *The Olympian* to inform the public that an application had been submitted and to invite comment on the reissuance of the NPDES permit and this permit.

The Department will publish a Public Notice of Draft (PNOD) on January 9, 2006, in *The Olympian* to inform the public that a draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Water Quality Permit Administrator
Department of Ecology
Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the 30-day comment period to the address above. The request for a hearing shall indicate the interest of the party and reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-216-100). Public notice regarding any hearing will be circulated at least 30 days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing.

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within 30 days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, (360) 407-6278, or by writing to the address listed above.

This fact sheet and permit were written by Dave Dougherty.

APPENDIX B--GLOSSARY

Ambient Water Quality--The existing environmental condition of the water in a receiving water body.

Ammonia--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Average Monthly Discharge Limitation--The average of the measured values obtained over a calendar month's time.

Beneficial Use – The use of reclaimed water, that has been transported from the point of production to the point of use without an intervening discharge to the waters of the state, for a beneficial purpose.

Best Management Practices (BMPs)--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD₅--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD₅ is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass--The intentional diversion of waste streams from any portion of the collection or treatment facility.

Chlorine--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Compliance Inspection - Without Sampling--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling--A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the 85 percent removal requirement. Additional sampling may be conducted.

Composite Sample--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots.

Construction Activity--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Continuous Monitoring --Uninterrupted, unless otherwise noted in the permit.

Distribution Uniformity--The uniformity of infiltration (or application in the case of sprinkle or trickle irrigation) throughout the field expressed as a percent relating to the average depth infiltrated in the lowest one-quarter of the area to the average depth of water infiltrated.

Engineering Report--A document, signed by a professional licensed engineer, which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Groundwater Recharge Criteria – The contaminant criteria found in the drinking water quality standards adopted by the state board of health pursuant to chapter 43.20 RCW and the department of health pursuant to chapter 70.119A RCW.

Grab Sample--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

Industrial Wastewater--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Maximum Daily Discharge Limitation--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method Detection Level (MDL)--The minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

pH--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Quantitation Level (QL)-- A calculated value five times the MDL (method detection level).

Reclamation Facility – means an arrangement of devices, structures, equipment, processes, and controls which produce reclaimed water suitable for the intended reuse.

Reclaimed Water – Effluent derived in any part from sewage from a wastewater treatment system that has been adequately and reliably treated, so that as a result of that treatment, it is suitable for a beneficial use or a controlled use that would not otherwise occur and is no longer considered wastewater.

Sample Maximum -- No sample shall exceed this value.

Soil Scientist--An individual who is registered as a Certified or Registered Professional Soil Scientist or as a Certified Professional Soil Specialist by the American Registry of Certified Professionals in Agronomy, Crops, and Soils or by the National Society of Consulting Scientists or who has the credentials for membership. Minimum requirements for eligibility are: possession of a baccalaureate, masters, or doctorate degree from a U.S. or Canadian institution with a minimum of 30 semester hours or

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45 quarter hours professional core courses in agronomy, crops or soils, and have 5,3,or 1 years, respectively, of professional experience working in the area of agronomy, crops, or soils.

Surface Percolation – The controlled application of water to the ground surface for the purpose of replenishing ground water.

State Waters--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based Effluent Limit--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Coliform Bacteria—Coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. A microbiological test is used to detect and enumerate the total coliform group of bacteria in water samples.

Total Dissolved Solids--That portion of total solids in water or wastewater that passes through a specific filter.

Total Suspended Solids (TSS)--Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

Water Quality-based Effluent Limit--A limit on the concentration of an effluent parameter that is intended to prevent pollution of the receiving water.

APPENDIX C--RESPONSE TO COMMENTS

The following comments were received during the Public Notice of Permit held for State Reclaimed Water Permit ST 6206. The public notice lasted from January 9, 2006, through February 8, 2006. A Public hearing was not held.

Below is a listing of the comments that were received. Each comment is followed by the corresponding response, permit change (or lack of change), and the Department justification of the change (or lack of change).

Comments by Mr. David Ragsdale

Comment #1:

The description of treatment processes (page 3 of fact sheet) does not indicate whether the treatment includes nitrification/denitrification to reduce nitrogen in the final effluent. LOTT representatives have stated treatment to reduce nitrogen in the effluent will be provided. More detailed information should be provided about the treatment process being employed at the new WWTP and the expected effluent quality.

Response #1:

The description of the treatment processes in the fact sheet lists the unit operations at the reclaimed water plant and was not meant to be a detailed description of the plants capability. The plant does include a pre-anoxic cell and two equally sized aeration basins, as listed in the fact sheet, and the plant is capable of being operated for nitrification/denitrification. The two equally sized cells are operated in series with air on/off cycling, where one cell is aerated while the other is un-aerated. This operating scheme optimizes nitrification and de-nitrification in the aeration basins. The design effluent quality will meet the 10 mg/L nitrogen standard as required by the permit. If more detailed information on the plant is desired, please refer to the *Hawks Prairie Reclaimed Water Satellite Basis of Design Report (December 2003)* and the *Plans and Specifications for the Hawks Prairie Reclaimed Water Satellite Plant Phase I, Second MGD (April 2004)*. The fact sheet was not revised.

Comment #2:

The proposed permit limitation of 10 mg/L total nitrogen is not protective of state water quality standards applicable to Woodland Creek and Henderson Inlet. The proposed limit of 10 mg/L is based on discharge to ground for protection of drinking water. However, the limitation for nitrogen should instead be based on “not causing or contributing” (40 CFR 122.44) to the existing surface water quality problems in this watershed. It is a fact that surface water flow in Woodland Creek during the dry season (late summer and fall) is exclusively derived from inflow of the shallow groundwater (WDOE, Sargeant, 2005). This inflow of groundwater establishes a hydraulic connection between surface waters and the proposed discharge of LOTT’s effluent into that ground water. Discharge of 10 mg/L will cause the nitrate concentration to increase in the groundwater underlying the application site and eventually increase concentrations of nitrogen in Woodland Creek. Therefore, to protect downstream surface water quality, the monthly average total N effluent limitation should reflect the expected effluent quality of the proposed treatment and be consistent with the 3.0 mg/L limitations that apply to the downtown LOTT WWTP.

The marine waters of Henderson Inlet are currently degraded and not meeting standards for dissolved oxygen (WDOE, Sargeant, 2005). Severe algae blooms also occur during the late summer and fall in Henderson Inlet. The pollutant identified responsible for causing these problems is excessive nitrogen and the majority of that nitrogen loading flows into Henderson Inlet from the tributary streams. Woodland Creek contributes the largest amount of nitrogen loading and discharges into the most sensitive southern end of Henderson Inlet (WDOE, Sargeant 2005). The shallow groundwater in Woodland Creek sub basin already suffers from high and increasing concentrations of nitrogen (Thurston County groundwater information, and Sargeant, 2005). Average concentrations of nitrogen in these streams are already double the EPA ecoregion criteria and are probably several times higher than what would naturally exist without human influences. Additional loading of nitrogen to groundwater in this watershed as would be authorized under the proposed permit will result in increased ground water concentrations that will increase pollutant loading to the already degraded surface waters.

Response #2:

The permit is for the use of reclaimed water and the law that applies is the Reclaimed Water Act, Chapter 90.46 Revised Code of Washington (RCW). The permit and uses are fully in compliance with the provisions of this RCW and with the *Water Reclamation and Reuse Standards* (September 1997). The applicable law and standards require the reclaimed water that is used for infiltration to meet the drinking water standards, including 10 mg/L for total nitrogen.

Regarding the concept of establishing limits for the protection of surface waters, the location of the infiltration facilities for the portion of the reclaimed water not used for irrigation is several miles from any potential point of entry into Woodland Creek or Henderson Inlet. The Department does not, at this time, have the policies and procedures in-place that would be necessary to place defensible limits for the protection of surface waters on a reclaimed water project so far removed from the surface waters of concern.

In the event that future monitoring shows impacts to ground water which may jeopardize surface waters, and if the Department establishes policies and procedures for including surface water quality-based limits for these cases, future cycles of the permit could reconsider this issue. No change was made to the permit.

Comment #3:

Discharges from on-site septic systems to shallow groundwater are suspected of being the principle cause of the elevated nitrogen levels in this area. Thurston County GeoData Center has published a map showing areas where ground water quality is a concern. This mapping shows a significant portion of Henderson Inlet watershed as having elevated nitrate concentrations in groundwater. Most of the residents served by on-site systems in this watershed also utilize shallow drinking water wells for domestic purposes. Local governments should prioritize extending sewage collection lines into these areas of degraded water quality and not allow addition septic to be installed. Additional septic systems will only contribute to making the existing water quality problems worse and increase the threat of further contaminating local drinking waters supplies. With sewerage to the areas where nitrate threatens surface and ground waters, this satellite WWTP will provide an alternative to discharges into groundwater from on-site septic systems and better protect water quality.

Response #3:

This satellite reclaimed water plant with its advanced treatment capability is a good alternative to the many septic systems in the area that only provided limited treatment to wastewater. This permit deals with the use of reclaimed water and is not the appropriate place to determine priority areas to sewer. The appropriate place to discuss extending sewers to replace septic tanks is during the local communities planning processes. The City of Lacey, which operates the collection system within much of the urban growth area (UGA) that is within the Henderson Inlet watershed, is presently updating their wastewater comprehensive plan. This plan update process is the appropriate place to submit your comment. No change was made to the permit.

Comments by Mr. Dennis Burke:

Comment #4:

I operate a small water system at the end of Marvin Road in Thurston County Washington. In addition to my water system there are several other small water systems serving several hundred residential customers in the area. We all draw potable water from the same aquifer to which sewage effluent is proposed to be discharged by the above-mentioned applicant. Although 50 to 100 feet in depth, this aquifer is not a confined aquifer but is in fact fractured and interconnected to the surface and to other aquifers in the area. So discharge of pollutants to the aquifer will affect all ground waters in the area, except perhaps the lower aquifer serving Tolmie State Park.

The proposed project will treat upwards to 5,000,000 gallons a day of sewage utilizing the conventional activated sludge sewage treatment process. The only improvement proposed is the utilization membrane clarification to replace conventional clarifiers. Although the proposal implies that all pollutants will be removed, the fact is that a variety of organic and inorganic, dissolved and particulate pollutants will be discharged to the groundwater. This fact is apparently acknowledged in the design wherein groundwater injection has been divided into cells to allow "regeneration" which implies the physical or biological removal of pollutants discharged to that cell or groundwater.

Of significant concern is the proposal to discharge polluted water to the aquifer and to remove the same quantity clean ground water from the aquifer. Basically they are proposing to exchange potable water for polluted water, thus compounding the impact of the polluted water discharge. This proposal will take the water rights of the current users.

The proposed monitoring consists of monitoring the effluent BOD, suspended solids, Nitrogen etc., all conventional pollutants measured when discharging to surface waters. The primary pollutants of concern such as Endocrine Disrupting Chemicals (EDCs) and a variety of drugs and medicines that are known to be discharged from secondary wastewater treatment facilities, with or without membrane bioreactors, will not be monitored nor controlled. These substances simply pass through the treatment system as proposed by the applicant. The EPA is conducting research on this issue at this time in accordance with the following quote on their web site. "Human hormones present in wastewater may not be treated well in typical publicly-owned treatment systems. Alkyl phenol ethoxylates entering sewage treatment plants are not destroyed, rather they are transformed to certain alkylphenols, suspected EDCs. This risk management research project will evaluate the fate of these known and likely EDCs in the treatment plants and will investigate, if needed, means of enhancing the waste treatment processes to properly manage these EDCs."

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Only a few monitoring wells are proposed where conventional pollutants will be periodically measured. Conservative organic pollutants that can have a severe impact on human health and well-being are not being monitored and therefore will be allowed to go unseen. The pollutants that are being monitored are the same pollutants that are monitored at conventional wastewater treatment facilities that discharged to the surface waters. But this proposal is for the discharge of pollutants to the ground waters, which are an extremely precious resource. At a minimum, if this proposal is to go forward, broad scope GCMS analysis must be performed at all monitoring stations and at existing domestic well water systems in the area to measure the proposed discharges affect on the groundwater. The applicant should be prepared to reimburse all water purveyors that are impacted by their activities. In addition the permit must limit the adverse organic chemicals that are discharged to the environment, see Water Quality Criteria.

Over the past 15 years we have seen a variety of pollutants in existing water systems surrounding the county's landfill that can be directly attributed to the activities at the Hawks Prairie landfill. We have also seen extensive degradation of the ground waters on Marvin Road resulting from the discharge of waste to the surface waters by Olympia Cheese Company. We cannot afford to see the remaining ground waters in the area destroyed by injecting inadequately treated waters that are not properly treated or monitored for the pollutants of concern.

I further request an extension in the comment period since I have only had four hours to read and respond to the proposal and the neighboring water systems are unaware of the proposal.

Response #4:

Under State law, domestic wastewater treated to reclaimed water standards is no longer considered wastewater. Reclaimed water is highly treated and is required to meet stringent limits and monitoring. The product water for this project is to be designated class A reclaimed water, which is the most highly treated form of reclaimed water, that needs to meet the most stringent requirements and is available for the widest number of uses.

The project will start at 2,000,000 gallons a day, with an expansion to 5,000,000 gallons a day still a number of years away. The membranes provide a positive barrier to pollutants and the plant also meets redundancy/reliability requirements that are more stringent than conventional treatment processes. The reclaimed water is a useable product water that will not take any water rights.

The monitoring required by the permit is standard for this type of reclaimed water project. The constituents monitored are representative of any other constituents that may be present. The proposed monitoring will give a good indication of the success of the treatment process and the protection of the groundwater.

However, the Department shares your interest in EDCs and drugs in wastewater. There are national studies being completed that may shed light on this issue. The Department recently did a study of a variety of drugs and personal care products in the Sequim area, including reclaimed water from the City of Sequim's reuse plant. The study, *Results of a Screening Analysis for Pharmaceuticals in Wastewater Treatment Plant Effluents, Wells, and Creeks in the Sequim-Dungeness Area* (November 2004) can be found at <http://www.ecy.wa.gov/biblio/0403051.html>. These limited results give no indication that pharmaceuticals and personal care products (PPCPs) represent a significant concern in the wells or creeks sampled. The study recommends that additional monitoring for PPCPs appears to be a low priority in connection with the Sequim and

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Sunland wastewater treatment plants. The Sequim plant is a class A reclaimed water plant that operates under the same requirements that the Martin Way satellite plant will.

There are ten monitoring wells at the use site, which should give ample information on the impact to groundwater. The Permittee has also completed groundwater modeling to predict groundwater mounding and the movement of the water away from the use site. The proposed permit will ensure that waters are properly treated and monitored, in compliance with all applicable laws and standards, and the permit was not changed due to these comments.

The comment period was not extended. The satellite reclaimed water project has gone through years of planning and public reviews. The satellite system is nearing completion and no justification has been given to delay permit issuance. The permit will be issued as planned.

Comments by the Reclaimed Water Policies Task Force, which includes representatives from each of the four LOTT Partner jurisdictions (*Lisa Dennis-Perez, Water Resources Specialist, City of Lacey; Peter Brooks, Water Resources Manager, City of Lacey; Jim Bachmeier, Water Resources Program Manager, Thurston County; Dan Smith, Acting Water Resources Program Manager, City of Tumwater; Barbara Wood, Utility Planner, Thurston County; and Tikva Breuer, Interim Supervisor, Drinking Water Planning and Implementation, City of Olympia*)

Comment #5:

Page 6, First Table, footnote f. There appears to be two conflicting statements about chlorine residual requirements in the draft Permit, so we're seeking clarification. It's not clear here whether a chlorine residual needs to be maintained within storage ponds, or just in the conveyance to storage ponds. (At the very bottom of pg 18 it states that chlorine residual may not be required within storage ponds, so it's not clear whether the Department is using its discretion to require it). Also, it was our understanding that withdrawal of water from the storage pond was not allowed. Is this footnote to be understood as saying that reclaimed water can be withdrawn from the storage pond if a chlorine residual of 0.5 mg/L has been maintained?

Response #5:

Chlorine residual needs to be maintained within the conveyance system. The storage pond referred to in this footnote would be storage prior to the distribution system. Since in this case the reclaimed water is directly piped to the use area, the last part of the footnote is not necessary and was deleted. The chlorine residual requirement can be waived by the Departments of Ecology and Health in certain circumstances, but no request by the Permittee to waive this requirement has been made. The wetland ponds and recharge basins at the use site do not need to maintain a chlorine residual. If reclaimed water is withdrawn from these ponds, a chlorine residual would be required in the subsequent distribution system, but not in the ponds. And again, this requirement can be waived, depending on the planned use.

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Comment #6:

Page 6, Second Table. The 2 mg/L enforcement limitation shown for fluoride is lower than current standards for groundwater and drinking water (4 mg/L for both). There is nothing in the fact sheet to justify this lower limit.

Response #6:

The fluoride limit of 2 mg/L is the secondary MCL listed in WAC 246-290-310 and is the appropriate standard to use. No change to the permit was made.

Comment #7:

Page 9, Sampling points. Our understanding is that two of the monitoring wells (MW-5 and MW-9) are mostly dry, but that they are expected to have water once the ponds are in use. In case these wells remain dry, there should be language here to exempt dry wells from monitoring requirements.

Response #7:

The water elevation needs to be checked per the monitoring requirements (quarterly), and if the well is dry that needs to be reported on the appropriate discharge monitoring report form. The Permittee does not need to further sample if there is nothing to sample. No change to the permit was made.

Comment #8:

Page 11, R3d. If the Permittee is monitoring more frequently to address internal engineering needs, why is it required that this data be submitted for review? Would an engineering sample exceeding compliance standards constitute a violation of the permit?

Response #8:

If the Permittee monitors the specified sampling points by the specified methods, the results need to be included with the submitted data. Monitoring at other locations or by other methods does not need to be submitted. The monitoring requirements are minimums, and more frequent monitoring by the specified procedures would be submitted and reviewed and would be a violation if a limit is exceeded. No change to the permit was made.

Comment #9:

Page 13, A3. Irrigation at agronomic rates will not present the same level of potential hazard as groundwater recharge, so it is not clear why they have the same planning requirements? It is overly burdensome and unnecessary to require a water balance and evaluation of potential impacts to ground and surface waters if irrigation is to be at agronomic rates.

A3 Suggestion: "...and for irrigation and surface percolation uses *in excess of agronomic rates*, the application rates, water balance...."

Response #9:

The evaluation may include the same topics, but that does mean to imply that the level of effort should be the same. If done at agronomic rates, the impacts would be easy to evaluate and should not be burdensome. It is true that in order to apply at agronomic rates, some effort needs to put into determining the appropriate agronomic rate. Basic information is necessary to justify the agronomic rate used. No change to the permit was made.

Comment #10:

Page 14, Cl. This paragraph should specifically highlight that stream flow augmentation is an allowed use under the State Water Reclamation and Reuse Standards.

Cl Suggestion: “Direct beneficial uses and requirements for use, including stream flow augmentation, are as listed...”

Response #10:

The *State Water Reclamation and Reuse Standards* do allow stream flow augmentation, but only if the use is covered by a NPDES permit. This is not a NPDES permit and therefore stream flow augmentation could not be allowed under this permit. This permit is a Reclaimed Water Permit issued under the authority of chapters 90.46 RCW and 173-216 WAC that only covers uses that go to ground, not to surface water. If stream flow augmentation is a desired use, this permit would need to be modified to become a combined NPDES and Reclaimed Water Permit or a new NPDES permit would be required. No change to the permit was made.

Comment #11:

Page 15, G2. This language serves as a deterrent to the use of reclaimed water. Rain water, once it contacts streets and runs down the curb, is of a lower quality than Class A Reclaimed Water. As this lower-quality stormwater is allowed to enter the storm drainage system, it does not seem reasonable to prohibit Class A Reclaimed Water from entering the storm system as a result of overspray. Overspray during irrigation is never desirable because it is wasteful, but a limited amount of overspray is unavoidable, even in the most efficient of irrigation systems. This provision could effectively prohibit use of reclaimed water to irrigate roadside medians and planter strips, since it is nearly impossible to avoid some overspray when irrigating these areas. In addition, under these restrictions, irrigation systems supplied by reclaimed water could not operate on windy days. This restriction is unworkable and unnecessary.

Response #11:

This language is not meant to make minor overspray a permit violation, but if there is enough overspray to cause visible surface runoff, then that is not minor, and should not be allowed. If irrigation is done at agronomic rates with only reasonable overspray, there should not be a flow of water off site. No change to the permit was made.

Comment #12:

Page 16, section J — Irrigation Use. Again, these requirements for irrigation use, especially the water balance, are overly burdensome and unnecessary. It is interesting to note that the Department’s Water Resources program has indicated that irrigation using reclaimed water is not

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an acceptable mitigation measure for water rights because agronomic application does not recharge groundwater. Also, the requirements in #4 appear to be written to address concerns that water will be disposed of through irrigation— and that use is not called irrigation.

Response #12:

The requirements in this permit were meant to match the requirements in the permit issued to the Permittee for reuse from the Budd Inlet Treatment Plant. This permit section includes some standard permit language that was inadvertently left in the draft, which should have been changed to match the Budd Inlet permit. A new section J, that matches the language in the Budd Inlet permit, was inserted in place of the draft permit language.

Comment #13:

Page 16, J1. If this section has to remain, specify here that this calculation will be provided as part of the Water Reuse Summary Plan and will be representative of the local area. It should be articulated that the hydraulic loading rate and detailed water balance analysis are not required for each individual use site.

Response #13:

See Response #12. This calculation can be provided as part of the Water Reuse Summary Plan.

Comment #14:

Page 16, J2. See comments above for Page 15; G-2.

Response #14:

See Response #12.

Comment #15:

Page 17, J4d. This requirement implies that the Permittee is responsible for constituents for which there are no current standards. “Constituents of Concern” is not justified. It would be more reasonable to stipulate “Cause leaching losses that violate groundwater standards.”

Response #15:

See Response #12.

Comment #16:

Page 17, L2. The “10 cm” limit seems arbitrary. This statement should contain the same caveat as above. “...pre-augmentation water level, unless data demonstrate that a net ecological benefit can be maintained at a higher rate.”

Response #16:

The requirement is straight out of the *Water Reclamation and Reuse Standards* and is the appropriate language to use. No change to the permit was made.

Comment #17:

Page 17, L3. These reduction limits imply that monitoring results can be attributed solely to the effect of reclaimed water. What about possible environmental degradation from unrelated factors? The references to 25 percent and 50 percent degradation appear arbitrary. Perhaps amphibian species decline by 30 percent, creating conditions for bird species to naturally increase by 30 percent. Would that be considered a violation of the permit?

Response #17:

The requirement is straight out of the *Water Reclamation and Reuse Standards* and is the appropriate language to use. The condition requires the Permittee to submit a report on the findings. If the Permittee can attribute degradation to unrelated factors, that will be part of the evaluation. If there are no other factors, then yes, a species decline of 30 percent would be considered a violation. No change to the permit was made.

Comment #18:

Page 18, M3. This statement could be misinterpreted to mean either that 1) groundwater is not considered “Waters of the State”; or 2) aquifer storage and recovery is not allowed.

M3 Suggestion: “The use of reclaimed water ... waters of the state, except that specified in an NPDES Permit, State Reclaimed Water Permit, or Water Reuse Summary Plan.” This would acknowledge the Permittee’s ability to specify the intent to store and recover reclaimed water and the Department’s authority to approve that intent.

Response #18:

Condition M3 was not clear or necessary, so was deleted from the permit.

Comment #19:

Page 18, R5 A3. This is in conflict with footnote ‘f’ on Page 6. The LOTT partners appreciate the flexibility that this provides. However, the permit needs to be consistent in its requirements.

Response #19:

The permit was not clear, and per response #5, footnote f was changed to help clarify the requirements. There is flexibility at the discretion of the Departments and depending on planned use.

Comment #20:

Page 26, G16. This statement should be clarified to ensure it is not misinterpreted to be in conflict with the language concerning Water Right Status on Page 5 of the Fact Sheet.

Response #20:

G16 is a standard condition for NPDES permits that is not needed in this state permit. The condition was deleted.

Comment #21:

Thank you for the opportunity to review the draft Permit. We hope that by providing these comments, we can work together to facilitate the beneficial use of high-quality reclaimed water throughout our local communities.

Response #21:

The Department encourages the beneficial use of the reclaimed water and will continue to work with the local communities to make it workable while still protecting the environment and human health.

Comments by the Permittee, LOTT Alliance (*Karla Fowler, Program Manager*)

Comment #22:

Section R1, Page 5, Reclaimed Water Limitations Table

<i>Parameter</i>	<i>Average Monthly</i>	<i>Sample Maximum</i>
<i>Turbidity</i>	<i>0.2 NTU</i>	<i>0.5 NTU</i>

The limit does not reflect the Reclaimed Water Standards nor was this limit identified in ongoing discussions with the Departments of Ecology and Health during nearly three years of design development and construction of the facility. The facility was designed based on meeting a turbidity standard of 2.0 NTU, similar to LOTT's Budd Inlet Treatment Plant Reclaimed Water Permit (included in NPDES Permit No. WA0037061). The Hawks Prairie facility plan and engineering report was originally approved with a 2 NTU performance goal identified. The planned uses of the Class A Reclaimed Water from the Hawks Prairie Satellite system are acceptable uses under the reuse standards. Imposing a limit tenfold more stringent than the State Standards could result in an undue operating burden on LOTT, as we try to achieve a limit that may be difficult to sustain. Further, there are no additional health and environmental benefits identified nor scientific basis offered with the suggested limit other than the selected technology is capable of higher performance.

During the design development, LOTT selected an operating strategy and technology to guarantee meeting the 2.0 NTU reclaimed water standard while affording operational flexibility. We elected to do this to better manage staffing levels and develop achievable emergency response programs to minimize overall life cycle and operating costs, LOTT also invested in automated control systems, control strategies, and standby power facilities to enable operators located at the Budd Inlet Treatment Plant to monitor and operate the Martin Way Reclaimed Water Plant without a full time staff person resident. Until we've had actual operating experience with this system, it's difficult to know what's really feasible.

Response #22:

The Department's policy is to approve documents and write permits based on the standards that are in effect at the time of the document approval or permit development. Unfortunately, this does mean that during a multiyear project, standards may change between initial review and final permit issuance. As you are aware, the Washington State reclaimed water standards are based on

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the California standards. California did a study of MBR facilities and determined that they should meet the 0.2 NTU and 0.5 NTU standard. They determined that when MBRs did not meet that standard, it was an indication of a leak in the membrane. For class A reclaimed water it is important not to have a leak. Washington State decided to adopt the California standard under Article 6 of the *Water Reclamation and Reuse Standards*. This article describes how we accept other methods of treatment that will assure an equal degree of treatment, public health protection and treatment reliability as those included in the standards. MBRs are not required to meet the “coagulated” requirement, and it should not be a surprise that alternate limits are employed to ensure treatment and reliability.

While the California standards seem sound in theory, there is some concern on how practical they are. You may be able to make the case that the limits are not practical to monitor and meet, but as you state, you’ve had no actual operating experience with this system, and it’s difficult to know what’s really feasible. Given this fact, the Department has no compelling reason to vary from our adopted standard. If the standard proves problematic, it can be evaluated later based on actual operational data. Given the circumstances, LOTT has no reason to fear enforcement action by the Department during initial operation of the facility, if at least the 2.0 NTU and 5.0 NTU standards are met. No change to the permit was made.

Comment #23:

Page 6, Ground Water Enforcement Limitations Table

<i>Primary Drinking Water Criteria</i>	<i>Sample Maximum</i>
<i>Total Trihalomethanes (TTHM)</i>	<i>0.10 mg/L</i>

LOTT is concerned about its ability to achieve the target level for TTHM at all monitoring well locations. The proposed limit is practically drinking water quality (0.10 mg/L versus 0.08 mg/L). The State’s Reclaimed Water Standards require LOTT to maintain a chlorine residual of at least 0.5 mg/L within the entire reclaimed water system. Consequently, LOTT determined the most cost effective disinfection method was sodium hypochlorite addition, since the primary disinfection dosage demand was not much greater than the dosage required to maintain the residual. Chlorine, when exposed to organic compounds, will have a potential to produce Trihalomethanes (THMs). Since LOTT is using membrane filtration, the soluble organic compounds fraction will approach 100 percent and the potential to form THMs will be similar regardless of the primary disinfection method selected. Using chloramines for disinfection could reduce this potential; however, it is not feasible since chloramines also introduce nitrogen, a target constituent (10 mg/L total nitrogen in reclaimed water plus 10 mg/L nitrate-N and 1 mg/L nitrite-N in the groundwater monitoring wells.) The attenuation and fate of THMs in the aquifer is not well understood and has been the subject of recent research. The results of these investigations suggest dilution, soil chemistry, biological activity, and time all may attenuate the TTHM concentration.

It is our opinion that this requirement is inconsistent with the reclaimed water Standards and in opposition to the regulatory direction received during the facility development. Further, it does not seem appropriate to impose a threshold criteria without fully understanding the ability to achieve it. To assure these levels could be achieved, LOTT will need to add additional treatment at the Martin Way Reclaimed Water Plant to remove total organic carbon. These processes are very costly to construct and operate.

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LOTT suggests this parameter be monitored and trended over time to determine a reasonable and achievable limit recognizing the monitoring wells are adjacent to the infiltration basins, the time of travel to the nearest potable extraction well exceeds one year, the influent wastewater contains residual THMs, and the physical chemical and biological interaction with local hydrogeology will not be understood until the facility is in operation. We suggest a more appropriate consideration would be a percent reduction goal until reasonable quantitative targets can be determined.

Response #23:

The 0.1 mg/L limit is the standard for reclaimed water groundwater monitoring and is based on WAC 246-290-310(4). While your concern may be justified, without data and operational experience there is not justification to change the limits. Exceeding the limits would lead to an evaluation of the situation prior to any potential enforcement. The limits placed in the permit apply to all the monitoring wells for now, but as a groundwater mound forms and we gather information over the initial years of use, it would be reasonable to narrow down the numbers of wells that the limits apply to. Wells that capture the plume prior to it leaving the site may be better monitoring points for compliance than the wells immediately under the recharge basins. No change to the permit was made, but as with turbidity, the Department is open to re-evaluation as data is gathered.

Comment #24:

Pages 6 and 7, Ground Water Enforcement Limitations Table

LOTT recommends the units all be represented consistently (either mg/L or µg/L) to avoid reporting and compliance confusion.

Response #24:

While there is some chance of confusion with inconsistent units, the units as expressed are consistent with permits for other facilities and Appendix A of the *Implementation Guidance for the Ground Water Quality Standards*. The units as listed are how the Department would like the results reported. No change to the permit was made.

Comment #25:

Pages 6 and 7, Ground Water Enforcement Limitations Table

LOTT has been conducting routine groundwater sampling at the monitoring wells (MW) to establish background water quality. Several of the wells, most notably MW7 and MW10, contain background levels in excess of the proposed limitations (including but not limited to arsenic, TDS, sodium, and iron). During development and drilling of MW10 the driller encountered excessive color and gas (although unsampled, it appeared to be a combination of methane and hydrogen sulfide). Excessive color was also noted at MW7. Other wells did not exhibit these same characteristics and both wells are located along the northern boundary of the site. Since our modeling indicates groundwater will migrate radially from our site and trend to the northwest, this suggests there may be a source of poor quality groundwater north and/or east of our site.

LOTT recommends these exceptions be identified, noted they are preexisting conditions and consequently LOTT cannot be responsible for water quality excursions. We support continued water quality monitoring and long term trending of results relative to existing background

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concentrations over time to demonstrate improvement. We believe our recharge operation will have a tendency to dilute poor water quality and constrain its movement downstream. Further, exceedances in these wells for selected constituents should not be reported as violations.

Response #25:

The Department encouraged the Permittee to gather background data so it could be determined if any existing conditions exceed the permit limits. This data is valuable to show the background condition and would be used in the event of a result that exceeds a permit limit. The Department has not seen the data you refer to, but would like to review and evaluate it. Once the reclaimed water use commences, the background data would be used to determine if an apparent exceedance is really a violation. No change to the permit was made, but as with other groundwater issues, the Department realizes that limits will need re-evaluation as data is gathered.

Comment #26:

Section R3, Page 11, Paragraph A first sentence DELETE “once”

Response #26:

This typo was deleted.

Comment #27:

Section R4, Page 13, Paragraph A

This paragraph states that the Water Reuse Summary Plan must be submitted “...before distribution of reclaimed water.” We would appreciate clarification as to whether or not this is presumed to include conveyance of Class A Reclaimed Water to LOTT Constructed Wetlands Ponds, especially during the initial testing phases. No distribution to other users will occur until we’re fully operational.

Response #27:

If the Permittee is just conveying reclaimed water to the constructed wetland ponds, and all of the water is still under the control of the Permittee, the Plan would not need to be submitted. The Plan would be due before any water is distributed for use off of Permittee property. No change to the permit was made.

Comment #28:

Page 16, Paragraph J

The term “detailed water balance” is unclear, and the requirements of this section seem superfluous if the reclaimed water is applied at agronomic rates. In response to similar comments about this requirement that were submitted on the Budd Inlet Treatment Plant’s Reclaimed Water Permit, the word “detailed” was removed and the Department noted that “a generalized hydraulic loading rate can be used for the region for like uses of reclaimed water.” We again request that “detailed” be removed. Plus, it would be helpful if the Departments of Ecology and Health would define a process for how to address this if it is to be required. We suggest the permit identify a

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standard for such balances including resources for suitable application rates based on the type of cover.

Response #28:

See Response #12.

Comment #29:

Page 17, Paragraph K

As in previous item, “detailed water balance” is not defined. As part of our facility approval process LOTT developed a groundwater model to demonstrate the capability and migration of reclaimed water applied at the Hawks Prairie Recharge site. This document has been previously submitted, and it is our understanding that it has been approved.

Response #29:

For the existing recharge basins, the information already provided to the Department would fulfill the requirement in R4.K.1. Information to meet R4.K.2 has not been submitted to the Department and would be due prior to use. No change to the permit was made.

Comment #30:

Page 17, Paragraph L

This section needs to clarify and/or distinguish constructed wetlands from natural wetlands. LOTT has created several wetland ponds, which were not designed to operate within these parameters since their function is to provide storage and attenuate peak flows.

Response #30:

This section states in the first sentence that it applies “for enhancement of natural wetlands.” That means it does not apply to your constructed wetlands. No change to the permit was made.

Fact Sheet

Comment #31:

Page 6, Technology Based Effluent Limitations

Similar to exception noted for turbidity limit (Comment #22). The State Reclaimed Water Standards are based on a 2.0 NTU limit, not 0.2 NTU. Membrane functionality and condition is monitored using transmembrane pressure not turbidity. LOTT selected the perforated strand membrane system to minimize the consequence of a membrane tear in accordance with its operating strategy. Since the membranes are strands immersed in the biological reactor, a broken membrane strand will plug. Consequently, the ten-fold more stringent limit places an unnecessary restriction on LOTT’s operations without corresponding environmental or public health benefits.

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Response #31:

See Response #22.

Comment #32:

Page 7, Ground Water Quality Based Criteria

Pursuant to discussion in above items, this section needs to be revised to reflect the existing water quality conditions and likelihood of exceeding the water quality standards (particularly in MW7 and MW10) — most notably the constituents TDS and arsenic.

Response #32:

The Fact Sheet was written based on information available at the time. While the Department would like to review the background data that has been collected, and this may have an impact on the permit, the Fact Sheet is not a living document and is not revised as new data is collected.

Comment #33:

Page 8, Comparison of Reclaimed Water Limitations with Secondary Treatment Limits

Similar to exception noted for turbidity limit. The Reclaimed Water Standards are based on a 2.0 NTU limit.

Response #33:

See Response #22.

Comment #34:

Thank you for the opportunity to provide these comments.

Response #34:

No response necessary.